

TEST DESIGN DOCUMENT

Fake News Detection using Social Media Data

(TCS iON – Industry Project)

By

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1. Project Overview

This document describes the test design for the Fake News Detection system developed as part of the TCS iON Industry Project. The purpose of this document is to define the testing approach used to validate the functional correctness of the system, ensuring accurate classification of social media and news text as fake or real using machine learning techniques.

2. Application / Screen

Model Frontend – News Classification

A Streamlit-based web application that allows users to input news or social media text and receive classification results along with confidence scores.

3. Test Design Overview

The testing approach focuses on validating the behavior of the machine learning model, confidence-based decision logic, and the integration between the frontend and backend components. Various input conditions are tested, including real news, fake news, ambiguous content, and invalid inputs.

Testing is functional in nature and does not involve factual verification of news against external sources.

4. Test Design Scope

In Scope

- Fake and real news classification
- Input validation for insufficient or invalid text
- Confidence threshold handling (≥ 0.90)
- Frontend and backend integration
- Prediction result display

Out of Scope

- Real-time fact checking
- Source credibility analysis
- Performance and load testing

5. Test Environment

- Programming Language: Python
- Frontend Framework: Streamlit
- Machine Learning Model: Logistic Regression
- Feature Extraction Technique: TF-IDF
- Sentiment Analysis: VADER
- Platform: Local system / Web browser

6. Test Design Details

Test Case ID: TD_01

- Test Step #: 1
- Application / Screen: Model Frontend – News Classification
- Test Description: Verify classification of a real news article
- Input: Real news article text
- Expected Result: System displays “Likely Real News” with confidence ≥ 0.90
- Pre-Requisites: Model and vectorizer loaded successfully
- Iteration #: 1
- Cross-Validation Method: K-Fold Cross Validation
- Actual Result: { "label": "Real", "confidence": 0.92 }
- Defect (Y/N): N

Test Case ID: TD_02

- Test Description: Verify classification of a fake news article
- Input: Fake or misleading news text
- Expected Result: “Likely Fake News” with confidence ≥ 0.90
- Actual Result: { "label": "Fake", "confidence": 0.93 }
- Defect: N

Test Case ID: TD_03

- Test Description: Verify behavior for insufficient or invalid input
- Input: Short or incomplete text
- Expected Result: Validation warning message is displayed
- Cross-Validation Method: Not Applicable
- Defect: N

Test Case ID: TD_04

- Test Description: Verify confidence-based handling for ambiguous content
- Input: Neutral or mixed-signal news text
- Expected Result: “Inconclusive” result due to confidence < 0.90
- Defect: N

7. Summary

This test design ensures that the Fake News Detection system is validated against all critical functional scenarios. The testing confirms correct classification behavior, reliable confidence handling, and smooth frontend–backend interaction.